**SUPPLEMENTARY TABLES**

**Supplementary Table 1:** Unit cost of input and produce used in rice-ratoon rice cropping sequence

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sl. No. | Particulars | Quantity/ha | Rate (Rs.) | Amount (Rs. ha-1) |
| Input |
| 1 | Fertilizer |
| Urea | 140 kg | 7.00 kg-1 | 980.00 |
| Diammonium phosphate | 88 kg | 26.00 kg-1 | 2288.00 |
| Muriate of Potash | 67 kg | 16.00 kg-1 | 1072.00 |
| 2 | Seed |
| Rice seed | 30 kg | 25 kg-1 | 750.00 |
| 3 | Pesticides |
| Bavistin | 60 g | 600 kg-1 | 36.00 |
| Carbofuran 3 G | 30 kg | 70 kg-1 | 2100.00 |
| Chloropyriphos 20 EC | 3 lit | 320 lit-1 | 960.00 |
| 4 | Land preparation (Tractor 16 hrs ha-1)  | 16 hrs | 350 hr-1 | 5600.00 |
| 5 | Herbicide and other weed management practices |
| Azimsulfuron 50DF | 70 g | 982 per 28g | 2455.00 |
| Bispyribac sodium (Nominee Gold 10% EC) | 300ml | 408 per 40 ml | 3060.00 |
| Flucetosulfuron 10WP | 250 g | 910 per 100g | 2275.00 |
|  Bensulfuron methyl+pretilachlor 60+600 g ha-1 (Londax power) | 10 kg | 725 per 4 kg | 1812.50 |
| Weed free (hand weeding at 15,30,45 and 60 DAS) | 54 Man days | 194 & 204 Man days -1 in 2015 & 2016 respectively |  |
| Hand weeding (twice) | 38 Man days | Same as above |  |
| Paddy weeder fb hand weeding (once) | 22 Man days | Same as above |  |
| Herbicide spray (once) | 2 Man days | Same as above |  |
| Herbicide spray (twice) | 4 Man days | Same as above |  |
| 6 | Irrigation (hiring of pump sets) | 36 hrs | 150 hour-1 | 5400.00 |
| 7 | Labour for other field operations | 64 Man days | 194 & 204 Man days -1 in 2015 & 2016 respectively |  |
| Produce |
| 89. | Rice Grain | - | 1410 and1470 kg-1 in 2015 and 2016 respectively |  |
| Rice Straw | - | 500 t-1 |  |

**Supplementary Table 2**: Energy equivalent of inputs and outputs used in rice-ratoon rice cropping system

|  |  |  |
| --- | --- | --- |
| Input | Unit | MJ/unit |
| Human labour | Man hour | 1.96 |
| Fossil Fuel ( Diesel) | L | 47.87 |
| Electricity  | kWh  | 3.6  |
| Nitrogen (N)  | kg  | 60.6  |
| Phosphorus (P2O5)  | kg  | 11.1  |
| Potassium (K2O)  | kg  | 6.7  |
| Farm Yard Manure  | kg  | 0.47  |
| Insecticides/Pesticides/Weedicides  | kg  | 120  |
| Insecticides/Pesticides/Weedicides  | L | 102  |
| Fungicide  | kg  | 97  |
| Machinery including self-propelled  | kg  | 68.4  |
| Electric motor  | kg  | 64.8  |
| Irrigation  | m3  | 1.02  |
| Seeds (Rice)  | kg  | 14.7  |
| Output |  |  |
| Grain (Rice) | kg | 14.7 |
| Straw (Rice) | kg | 12.5 |

**Supplementary Table 3 Weed flora infested the main rice crop (averaged data of two years)**

|  |  |  |  |
| --- | --- | --- | --- |
| Scientific name | Common name | Family | Weed composition (%) |
| Grasses |  |  | (15.11) |
| *Echinochloa glabrescens* Munro ex Hook. f. | Cockspur Grass | Poaceae | 6.96 |
| *Leptochloa chinensis* (L.) Nees | Chinese Sprangletop | Poaceae | 6.00 |
| *Echinochloa crus-galli* (L.) P. Beauv. | Barn yard Grass | Poaceae | 1.60 |
| *Echinochloa colona* (L.) Link | Jungle Rice | Poaceae | 0.55 |
| Sedges  |  |  | (71.44) |
| *Cyperus difformis* L. | Small flower Umbrella Sedge | Cyperaceae | 40.24 |
| *Scirpus juncoides Roxb.* | Bulrush | Cyperaceae | 26.33 |
| *Cyperus iria* L. | Rice Flat Sedge | Cyperaceae | 3.51 |
| *Fimbristylis mileacea* (L.) Vahl | Forked Fringerush | Cyperaceae | 1.39 |
| Broad leaved weeds |  |  | (13.42) |
| *Ludwigia adscendes* (L.) Hara | Water Primose | Onagraceae | 0.83 |
| *Sphenoclea zeylanica* G*a*ertn*.* | Goose weed | Sphenocleaceae | 0.62 |
| *Monochoria vaginalis* (Burm.F.) C. Presl ex Kunth | Oval-leafed Pond Weed | Pontederiaceae | 1.04 |
| *Marsilea quadrifolia* L. | Four leaf clover | Marsileaceae | 0.56 |
|  *Lindernia anagallis (Burm.f) Pennell* | Gadajvel | Linderniaceae | 7.49 |
| *Spirodela polyrhiza* (L.) | Giant duckweed | Araceae | 2.88 |

*The value in the parenthesis represents the % of different weed flora group infested the main rice crop*

**Supplementary Table 4 Weed flora infested the ratoon rice crop (averaged data of two years)**

|  |  |  |  |
| --- | --- | --- | --- |
| Scientific name | Common name | Family | Weed composition (%) |
| Grasses |  |  | (24.7) |
| *Echinochloa glabrescens* Munro ex Hook. f. | Cockspur Grass | Poaceae |  12.5 |
| *Leptochloa chinensis* (L.) Nees | Chinese Sprangletop | Poaceae | 5.5 |
| *Echinochloa crus-galli* (L.) P. Beauv. | Barn yard Grass | Poaceae | 4.2 |
| *Echinochloa colona* (L.) Link | Jungle Rice | Poaceae | 2.5 |
| Sedges |  |  | (7.5) |
| *Scirpus juncoides Roxb.* | Bulrush | Cyperaceae | 7.5 |
| Broad leaved weeds |  |  | (67.8) |
| *Ludwigia adscendes* (L.) Hara | Water Primose | Onagraceae | 22.5 |
| *Sphenoclea zeylanica* G*a*ertn*.* | Goose weed | Sphenocleaceae | 21.5 |
| *Monochoria vaginalis* (Burm.F.) C. Presl ex Kunth | Oval-leafed Pond Weed | Pontederiaceae | 18.5 |
| *Marsilea quadrifolia* L. | Four leaf clover | Marsileaceae | 5.3 |

*The value in the parenthesis represents the % of different weed flora group infested the ratoon rice crop*

**Supplementary Table 5: Visual toxicity of herbicides on rice crop (averaged data of two years)**

|  |  |
| --- | --- |
| Treatments  | Visual toxicity rating of herbicides on rice crop |
|  7 DAA | 14 DAA | 21 DAA |
| T1: Azimsulfuron  | 0.0 | 0.0 | 0.0 |
| T2: Flucetosulfuron  | 0.0 | 0.0 | 0.0 |
| T3: Bispyribac sodium  | 0.0 | 0.0 | 0.0 |
| T4: Bensulfuron-methyl + pretilachlor  | 2.5 | 0.7 | 0.0 |
| T5: Azimsulfuron+bispyribac sodium  | 0.0 | 0.0 | 0.0 |
| T6: Flucetosulfuron fb bispyribac sodium  | 4.0 | 2.3 | 0.0 |
| T7: Manual weeding twice  | 0.0 | 0.0 | 0.0 |
| T8: Paddy weeder fb manual weeding  | 0.0 | 0.0 | 0.0 |
| T9: Weed free | 0.0 | 0.0 | 0.0 |
| T10: Weedy check | 0.0 | 0.0 | 0.0 |

DAA, days after application

**Supplementary Table 6: Levene's test for homogeneity of variances in between two years of observation**

|  |  |  |  |
| --- | --- | --- | --- |
| Parameters | F-ratio  | *P*-value | Significance |
| *Main crop* |
| Grain yield (t ha-1) | 0.65634 | 0.421166 | The result is not significant at p < 0.05. The requirement of homogeneity is met. |
| Panicles m-2 | 0.53701 | 0.466626 | The result is not significant at p < 0.05. The requirement of homogeneity is met. |
| Grains panicle-1 | 0.05499  | 0.81542 | The result is not significant at p < 0.05. The requirement of homogeneity is met. |
| Test weight (g) | 1.76828  | 0.188801 | The result is not significant at p < 0.05. The requirement of homogeneity is met. |
| *Ratoon crop* |
| Grain yield (t ha-1) | 0.82565 | 0.367295 | The result is not significant at p < 0.05. The requirement of homogeneity is met. |
| Panicles m-2 | 0.01275  | 0.910489 | The result is not significant at p < 0.05. The requirement of homogeneity is met. |
| Grains panicle-1 | 0.00108 | 0.973962 | The result is not significant at p < 0.05. The requirement of homogeneity is met. |
| Test weight (g) | 0.66257 | 0.418985 | The result is not significant at p < 0.05. The requirement of homogeneity is met. |

**Supplementary Table 7: ANOVA table of grain yield (main and ratoon crops) in factorial RBD with weed management treatments (level 10) and years (level 2) as factors**

|  |
| --- |
| Parameter: Grain yield of main crop (t ha-1) |
| ANOVA table | Df | Sum Sq | Mean Sq | F value | Pr(>F) | Sig |
| Replication | 2 | 0.0073 | 0.00366 | 0.0697 | 0.93281 |  |
| Weed management (wm) | 9 | 19.417 | 2.15745 | 41.0584 | < 2.2e-16 | \*\*\* |
| Year (yr) | 1 | 1.855 | 1.85504 | 35.3033 | 6.85E-07 | \*\*\* |
| wm × yr | 9 | 0.9745 | 0.10828 | 2.0607 | 0.05864 | NS |
| Residuals | 38 | 1.9967 | 0.05255 |  |  |  |
| Parameter: Grain yield of ratoon crop (t ha-1) |
| ANOVA table | Df | Sum Sq | Mean Sq | F value | Pr(>F) | Sig |
| Replication | 2 | 0.09004 | 0.04502 | 2.057 | 0.141841 |  |
| Weed management (wm) | 9 | 2.64136 | 0.29348 | 13.4093 | 2.47E-09 | \*\*\* |
| Year (yr) | 1 | 0.31974 | 0.31974 | 14.6089 | 0.000477 | \*\*\* |
| wm × yr | 9 | 0.02593 | 0.00288 | 0.1316 | 0.998515 | NS |
| Residuals | 38 | 0.83169 | 0.02189 |  |  |  |

**Supplementary Table 8: Effect of weed control practices on grain yield (t ha-1)** **of wet direct sown rice-ratoon rice system**

|  |  |  |
| --- | --- | --- |
| Treatments | 2015 | 2016 |
| Main rice | Ratoon rice | Main rice | Ratoon rice |
| T1 | 5.50AB | 1.71ABC | 5.26BC | 1.59BC |
| T2 | 5.62AB | 1.79ABC | 5.22BC | 1.61BC |
| T3 | 5.55AB | 1.74ABC | 5.25BC | 1.55BC |
| T4 | 5.67AB | 1.82ABC | 5.42ABC | 1.64BC |
| T5 | 5.65AB | 1.61BC | 5.35ABC | 1.53BC |
| T6 | 5.38B | 1.57C | 5.27BC | 1.46C |
| T7 | 5.74AB | 1.92AB | 5.54AB | 1.71AB |
| T8 | 5.47AB | 1.71ABC | 4.97C | 1.57BC |
| T9 | 5.90A | 2.01A | 5.74A | 1.88A |
| T10 | 4.18C | 1.16D | 3.13D | 1.05D |
| Pr>F (Error df=18) | <0.000 | 0.001 | <0.000 | 0.0001 |

(*T1-Azimsulfuron, T2-Flucetosulfuron, T3-Bispyribac sodium, T4-Bensulfuron-methyl +pretilachlor, T5-Azimsulfuron+bispyribac sodium, T6-Flucetosulfuron followed by bispyribac sodium, T7-Manual weeding twice, T8-Paddy-weeder fb manual weeding, T9 -Weed free, T10-Weedy check*) *Means with at least one letter common are not statistically significant using Tukey Honestly Significant Difference (HSD) post-hoc test at P<0.05)*